DVCS and GMp Symbiosis

A View from the DVCS Collaboration

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Three models:

- Independence
  - GMp installs and runs first ~1 PAC month
    - Full operation of both HRS for GMp, no Luminosity limits from DVCS
  - One month shutdown for DVCS installation
  - DVCS runs ~3 PAC months
  - No modification to scattering chamber needed
- Cooperation
  - GMp and DVCS install together (except DVCS Calo.)
  - GMp runs independently
    - Restrictions on HRS angles from vacuum chamber and DVCS stand
    - Restrictions on HRS movement from DVCS cables and stand,
    - HRS movement needs manual assistance
  - One week shutdown to install DVCS Calo.
  - DVCS runs ~3 PAC months
    - GMp acquires parasitic data in HRS-R at large angles.
- Symbiosis
  - GMp and DVCS fully install together
  - GMp and DVCS running is interlaced (circa weekly)
    - Maximum luminosity is 25μA × 15 cm LH_2 (radiation limit for DVCS Calo.)
    - Beam in Compton Chicane
    - Restrictions on HRS angles and movement
    - GMp acquires "unlimited" parasitic data in wide angle HRS-R
      - Luminosity is correlated with beam energy: 10^{37} @ 6.6 GeV, of $10 \cdot 10^{37}$ @ 11 GeV
    - GMp angles < 40° only accessible with HRS-L
      - DVCS Calo parked in "safe mode" at 5.5 m from target at 15°

DVCS Cabling

Spectrometers movement must be monitored in the Hall

DVCS cables must be moved by hand
with HRS-L movement
(multi-person effort)

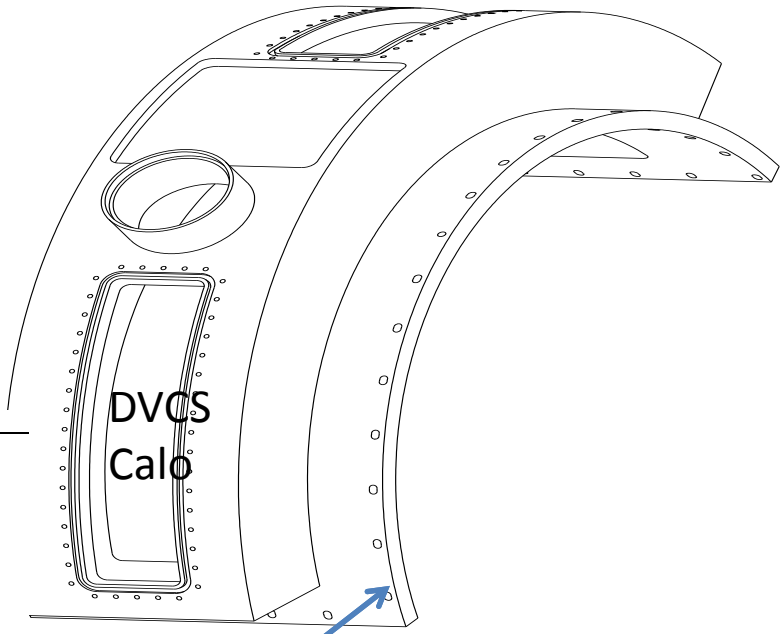
Angle Restrictions

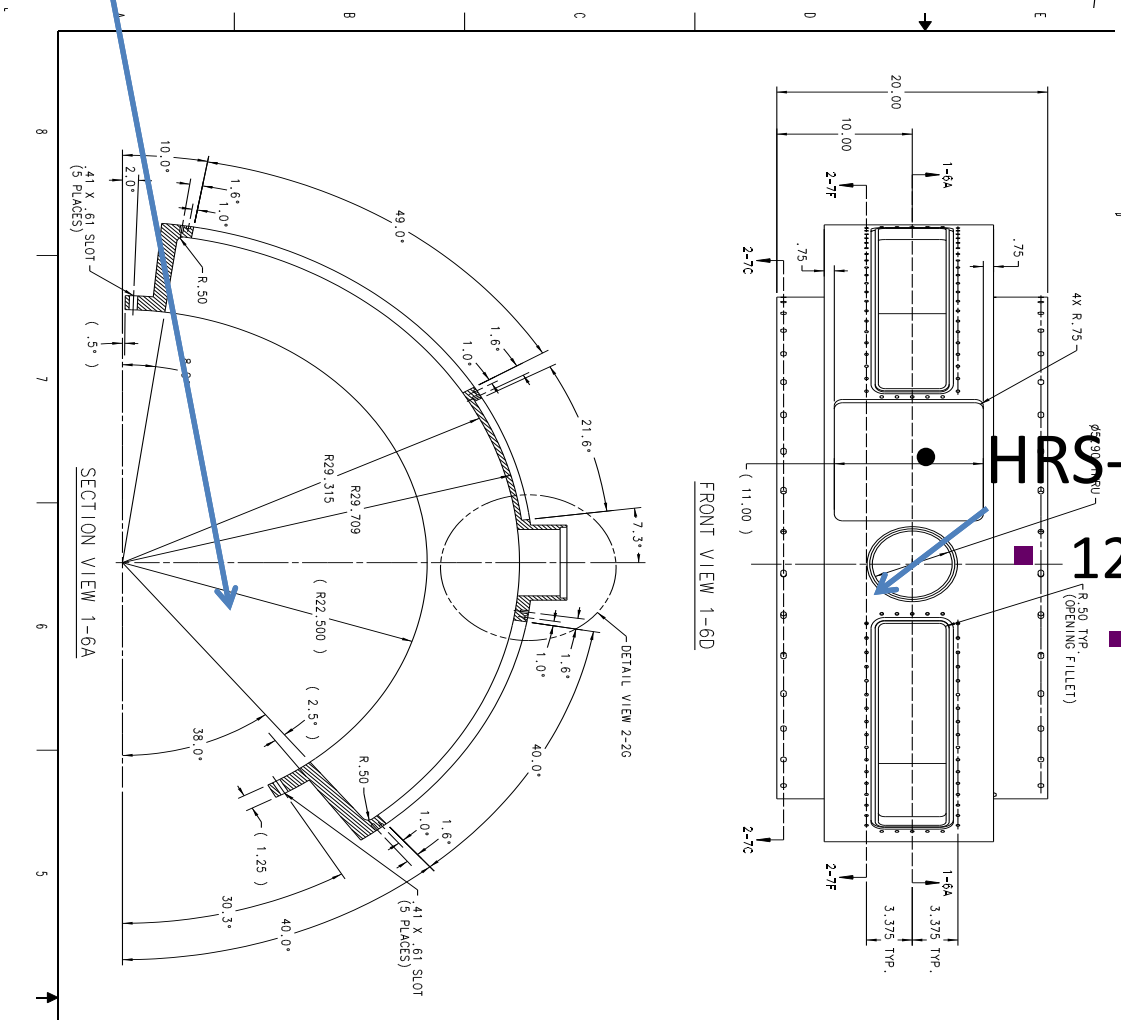
(Approximate, to be revised)

- Minimum (central) HRS—DVCS-Calo opening angle: 25° (limited by DVCS-Calo stand)
  - θ(HRS-L)–θ(DVCS-Calo) ≥ 28.7°
    - HRS-L ≥ 19° with DVCS-Calo @ –9.7°
  - θ(DVCS-Calo)–θ(HRS-R) ≥ 34.5°
    - |HRS-R| ≥ 49° with DVCS-Calo @ –14.5°
- Restrictions of the common Scattering Chamber design
  - HRS-L ≤ 46°
  - HRS-R: 33°—80°

Scattering Chamber

- HRS-R (central angles)
  - 49°—80° w/ DVCS Calo @ 14.5°





HRS-L

- 12.5°—46° (central angles)
  - 14.5° min w/ Calo @ 14.5°

E12-04-114 DVCS Kinematics: nucl-ex/0609015

Beam (GeV)	k' (GeV)	θ (HRS-L)	Q^2 (GeV^2)	x_{Bj}	Beam (μA)	θ(Calo)	d(Calo) (m)	Time (days)	
6.6	2.15	26.5°	3.0	0.36	5.0	–11.7°	1.5	3	
6.6	3.20	22.5	3.1	0.50	5.0	–18.5	1.5	5	
Subtotal days @ 6.6 GeV									8
8.8	2.88	22.9	4.0	0.36	8.5	–10.3	2.0	2	
8.8	3.68	22.2	4.8	0.50	8.5	–14.5	2.0	4	
8.8	4.27	21.2	5.1	0.60	5.0	–17.8	1.5	13	
8.8	3.47	25.6	6.0	0.60	5.0	–14.1	1.5	16	
Subtotal days @ 8.8 GeV									35
11.0	4.26	17.9	4.5	0.36	13.	–10.8	2.5	1	
11.0	4.29	21.1	6.3	0.50	13.	–12.4	2.5	4	
11.0	3.32	25.6	7.2	0.50	13.	–10.2	2.5	7	
11.0	4.16	23.6	7.7	0.60	13.	–13.1	2.5	13	
11.0	3.00	30.2	9.0	0.60	20.	–10.2	3.0	20	
Subtotal days @ 11 GeV									45